FORAGE SUITABILITY GROUP
Saline/Sodic

FSG No.: **G106XY895NE**

Major Land Resource Area: 106X - Nebraska and Kansas Loess-Drift Hills

Physiographic Features
The soils in this group are found on level flood plains.

	Minimum	Maximum
Elevation (feet):	1000	1650
Slope (percent):	0	2
Flooding:		
Frequency:	Occasional	Occasional
Duration:	Brief	Brief
Ponding:		
Depth (inches):		
Frequency:	None	None
Duration:	None	None
Runoff Class:	Very low	Low

Climatic Features
Annual precipitation varies widely from year to year in MLRA 106. Average annual precipitation for all climate stations listed below is about 34 inches. About 71 percent of that occurs during the months of April through September. On average there are about 35 days with greater than .1 inches of precipitation during the same time frame. Annual precipitation and temperature increase from the north to the south in the MLRA.

Average annual snowfall ranges from 16 inches at Wamego, KS to 37 inches at Wahoo, NE. Snow cover at depths greater than 1 inch range from 10 days at Holton, KS to 42 days at Auburn, NE.

Average July temperatures are about 79 degrees F., and average January temperatures are about 25 degrees F. Recorded temperature extremes in the MLRA during the years 1961 to 1990 are a low of -31 at Waho, NE, and a high of 110 recorded at Auburn and Pawnee City in Nebraska and also at Centralia and Holton in Kansas.. The MLRA lies mostly in USDA Plant Hardiness Zones 5a and 5b.

At Topeka, KS, the average annual wind speeds are about 9.7 MPH. The highest wind speeds occur during February though May. It is cloudy about 154 days a year. Average morning relative humidity in June is about 87 percent and average afternoon humidity is 62 percent.

At Lincoln, NE, the average annual wind speeds are about 10.1 MPH. The highest wind speeds occur during March and April. It is cloudy about 149 days a year. Average morning relative humidity in June is about 83 percent and average afternoon humidity is 58 percent.

The climate data listed in the tables below represent high and low ranges and averages for the climate stations and dates listed. For additional climate data access the National Water and Climate Center at http://www.wcc.nrcs.usda.gov.

	From	To
Freeze-free period (28 deg)(days): (9 years in 10 at least)	162	201
Last Killing Freeze in Spring (28 deg): (1 year in 10 later than)	Apr 29	Apr 15
Last Frost in Spring (32 deg): (1 year in 10 later than)	May 10	Apr 22
First Frost in Fall (32 deg): (1 year in 10 earlier than)	Sep 20	Oct 15
First Killing Freeze in Fall (28 deg): (1 year in 10 earlier than)	Oct 01	Oct 26
Length of Growing Season (32 deg)(days): (9 years in 10 at least)	140	183
Growing Degree Days (40 deg):	5742	6961
Growing Degree Days (50 deg):	3881	4376
Annual Minimum Temperature:	-20	-10
Mean annual precipitation (inches):	30	39

Monthly precipitation (inches) and temperature (F):

2 years in 10:	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Precip. Less Than	0.25	0.24	0.85	1.36	2.58	1.84	1.69	1.79	1.52	0.83	0.49	0.35
Precip. More Than	1.99	1.61	3.94	4.95	6.62	8.42	6.02	5.71	6.87	5.10	3.62	2.69
Monthly Average:	0.81	0.92	2.38	3.03	4.47	5.00	3.74	4.06	4.18	2.81	1.72	1.19
Temp. Min.	10.8	15.7	27.1	39.6	50.7	60.4	65.5	62.4	52.8	40.3	28.3	15.8
Temp. Max.	39.2	44.7	56.8	68.9	77.4	85.7	91.3	89.4	81.3	70.9	55.5	42.3
Temp. Avg.	25.4	30.7	42.1	54.6	64.5	73.6	78.6	76.1	67.6	56.4	42.2	29.4

Climate Station	**Location**	**From**	**To**
KS1408	Centralia, KS	1961	1990
KS3759	Holton, KS	1961	1990
KS4559	Lawrence, KS	1961	1990
KS8563	Wamego, KS	1961	1990
NE0435	Auburn, NE	1961	1990
NE6570	Pawnee City, NE	1961	1990
NE8395	Syracuse, NE	1961	1990
NE8905	Wahoo, NE	1961	1990

Soil Interpretations

This group consists of poorly and somewhat poorly drained, moderately fine to medium textured soils formed from silty and clayey alluvium on flood plains. Permeability is moderately slow to slow. This group has a watertable that comes to near the surface during a portion of the growing season. Salinity and/or sodicity is high.

Drainage Class:	Poorly drained	To	Somewhat poorly drained
Permeability Class: (0 - 40 inches)	Slow	To	Moderately slow
Frost Action Class:	High	To	High

	Minimum	Maximum
Depth:	72	
Surface Fragments >3" (% Cover):	0	0
Organic Matter (percent): (surface layer)	1.0	6.0
Electrical Conductivity (mmhos/cm): (0 - 24 inches)	8	16
Sodium Absorption Ratio: (0 - 12 inches)	7	35
Soil Reaction (1:1) Water (pH): (0 - 12 inches)	6.1	8.4
Available Water Capacity (inches): (0 - 60 inches)	6	12
Calcium Carbonate Equivalent (percent): (0 - 12 inches)	0	6

Soil Series

Crete Varient Salmo Zoe

Adapted Species List

The following forage species are considered adapted to grow on the soils in this group. Additional information concerning plant characteristics of a number of the listed species as well as individual cultivars of many of those species can be accessed on the web at http://plants.usda.gov/.

Cool Season Grasses	Symbol		Warm Season Grasses	Symbol	
Beardless wildrye	LETR5	G	Alkali sacaton	SPAI	F
Creeping foxtail	ALAR	F	Switchgrass	PAVIV	F
Intermediate wheatgrass	THIN6	F	**Legumes**		
Pubescent wheatgrass	THIN6	F	Alfalfa	MESA	F
Reed canarygrass	PHAR3	F	Alsike clover	TRHY	F
Tall fescue	LOAR10	F	Birdsfoot trefoil	LOCO6	F
Tall wheatgrass	THPO7	G	Cicer milkvetch	ASCI4	F

G - Good adaptation for forage production on this group of soils in this MLRA
F - Fair adaptation but will not produce at its highest potential

Production Estimates

Production estimates listed here should only be used for making general management recommendations. On site production information should always be used for making detailed planning and management recommendations.

The high forage production estimates listed below are based on dense, vigorous stands of climatically adapted, superior performing cultivars. They are properly fertilized for high yields, and pest infestations are kept below economic thresholds. Mechanical harvests are managed to maintain stand life by cutting at appropriate stages of maturity and harvest intervals. If grazed, optimum beginning and ending grazing heights are adhered to. Adequate time is allowed for plant recovery before entering winter dormancy under both uses.

The production estimates listed below represent total annual above ground plant production on an air-dry-matter basis. Estimates of hay and grazing yields can be calculated from these numbers by multiplying them by a harvest efficiency. A 70 percent harvest efficiency is commonly used when converting to hay yields. Pasture harvest efficiency is highly dependent on the grazing management system applied, ranging from 25 to 50 percent.

Forage Crop	Management Intensity	
	Low (lbs/ac)	High (lbs/ac)
Tall wheatgrass	2900	8000

Forage Growth Curves

Growth curves estimate the seasonal distribution of growth of the various forage crops. They indicate when the forages may be available for grazing or mechanical harvest.

Growth Curve Number: NE0601
Growth Curve Name: Alfalfa
Growth Curve Description: Alfalfa - MLRAs 107, 106, 75, irrigated 73, 72

Percent Production by Month											
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	10	25	25	20	15	5	0	0	0

Growth Curve Number: NE0602
Growth Curve Name: Cool-season grass
Growth Curve Description: Cool-season grass fertilized early - MLRAs 107, 106, 75, irrigated 73, 72

Percent Production by Month											
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	5	10	35	30	5	5	10	0	0	0

Growth Curve Number: NE0603
Growth Curve Name: Warm-season grass
Growth Curve Description: Warm-season grass - statewide

Percent Production by Month											
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	5	15	30	30	15	5	0	0	0

Soil Limitations

Salinity/Sodicity

- Species selection and productivity are severely limited by the salinity and/or sodicity levels of these soils.

Drainage

- These are somewhat poorly and poorly drained soils, and will experience periods when trafficability will be difficult or impossible.

Management Interpretations

Salinity/Sodicity

- When establishing new stands or renovating stands select species that are tolerant of the elevated salinity and/or sodicity levels of these soils.

Drainage

- Exclude livestock and machinery during extended periods of soil wetness to reduce soil compaction. Select species that are tolerant of somewhat poorly and poorly drained soils.

Compaction

- These soils are subject to compaction if grazed or machinery is operated on them when wet.

FSG Documentation

Similar FSGs:

FSG ID	FSG Narrative
G106XY700NE	Subirrigated soils do not have the high salinity levels and are more productive.
G106XY900NE	Seasonally Wet soils do not have the high salinity levels.

Inventory Data References:

Agriculture Handbook 296-Land Resource Regions and Major Land Resource Areas
Natural Resources Conservation Service (NRCS) National Water and Climate Center data
USDA Plant Hardiness Zone maps
National Soil Survey Information System (NASIS) database for soil surveys in Nebraska and Kansas counties in MLRA 106
Nebraska and Kansas NRCS Field Office Technical Guide
NRCS National Range and Pasture Handbook
Various Agricultural Research Service, Cooperative Extension Service, and NRCS research trials for plant adaptation and production.

State Correlation:

This site has been correlated with the following states:
KS
NE

Forage Suitability Group Approval:

Original Author: Tim Nordquist
Original Date: 3/8/01

Approval by:

_____ _____
State Range Management Specialist Date

_____ _____
State Range Management Specialist Date